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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/567,467

02/07/2006

Wilhelm Rademacher

3165-142

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7590

09/24/2010

ROTHWELL, FIGG, ERNST & MANBECK, P.C.

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WASHINGTON, DC 20005

EXAMINER

BROOKS, KRISTIE LATRICE

ART UNIT

PAPER NUMBER

1616

NOTIFICATION DATE

DELIVERY MODE

09/24/2010

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PTO-PAT-Email@rfem.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/567,467	<b>Applicant(s)</b> RADEMACHER, WILHELM	
	<b>Examiner</b> KRISTIE L. BROOKS	<b>Art Unit</b> 1616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 22 July 2010.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 11-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 11-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)                        | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Status of Application***

1. Claims 11-28 are pending.
2. Receipt and consideration of Applicants amendments/remarks filed on July 22, 2010 is acknowledged.
3. Rejections not reiterated from the previous Office Action are hereby withdrawn. The following rejections are either reiterated or newly applied. They constitute the complete set of rejections presently being applied to the instant application.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 11, 13-14, 19, 21, 23, and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Byers et al., The influence of Apogee and Its combination with Ethephon, Chemical Thinners, Cations, and/ or Adjuvants, Proceedings-Plant Growth Regulations Society of America, 2000.

Byers et al. teach the influence of Apogee (prohexandione-calcium) and ethephon on apple tree growth, control and return bloom (see the abstract and

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Introduction). The combination of Apogee and ethephon were found to provide good control of tree growth compared to the compounds used separately (see the Material and Methods, and Results and Discussion sections).

**Expt. 2.** In 1998, forty-eight 4-year-old 'Fuji/M.9' trees (8 blocks) were selected for 8 treatments (Figure 2). Prohexadione-calcium was applied alone to drip in 3 applications to the same trees at 63 ppm at PF, PF+14, and PF+28 days or PF+28, PF+42, and PF+56 days. In addition, ethephon was applied alone at 135 ppm at PF, PF+14, and PF+28 days or PF+28, PF+42, and PF+56 days. A combination of ethephon applied at PF, PF+14, and PF+28 days plus Apogee applied PF+28, PF+42, and PF+56 days; or a combination of Apogee was applied at PF, PF+14, and PF+28 days plus ethephon applied PF+28, PF+42, and PF+56 days. In the dormant season, average shoot length of the longest top two shoots, length of the five longest scaffold shoots, total length of shoots longer than 30 cm, weight and basal and terminal shoot diameters of these scaffold shoots, nodes/cm of the basal 40 cm, nodes/cm of the upper 30 cm of shoots, and time required to prune each tree, number of cuts/tree, and pruning weights/cm<sup>2</sup> trunk cross-sectional area (TCSA) per tree were recorded.

**Expt. 2.** In 1998, 3 applications of Apogee (63 ppm) or ethephon (135 ppm) did not affect shoot growth of 'Fuji/M.9' trees at these low rates (Figure 2). Only combinations of Apogee and ethephon gave good control of tree growth. Flowering and fruit set were not promoted by any of these applications.

With regard to the limitations in claim 1, "A method of the treatment of pome fruit for preventing, in a year after the treatment, reduced, floral development which results from the treatment with a compound of formula I", and "for preventing biennial bearing which may be induced by the treatment" comprising applying 2-chloroethylphosphonic acid (ethephon), it is the Examiner's position that since Byers et al. teach and exemplify the same application of both the instantly claimed compound of formula I and ethephon to a pome fruit, the limitations will inherently be met upon application to the apple tree.

***Response to Arguments***

Applicant's arguments filed July 22, 2010 have been fully considered but they are not persuasive.

Applicant argues that Byers et al. teach that the combined treatment of prohexadione-Ca and ethephon has no influence on flowering. And thus, Byers et al. definitely does not teach the combined treatment improves floral development. Applicant further argues that Byers et al. does not describe that prohexadione-Ca reduces floral development in the year after treatment.

This argument is not convincing. First, it should be noted that independent claim 11 does not contain the limitation "improved floral development". Claim 11 is drawn to preventing reduced floral development. As Applicant has stated on page 9 in the response to amendment, Byers et al. do not teach that the combined treatment had any influence on flowering and fruit set. Thus, the prior art reference did not result in reduced floral development but maintained its normal flower production.

Applicant does not specifically define what is meant by the phrase "reduced floral development" or "improvement of floral development". It is noted that on page 3 lines 11-14 of the instant specification, Applicant describes the "improvement in floral development" to encompass complete or at least partial prevention of reduced floral development associated with administration of acyclohexandiones (see page 3 lines 11-14). However, Applicant also states that "at the same time, the treatment should naturally lead to reduced vegetative growth" (see page 3 lines 14-15). Thus, Applicant

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recognizes that the treatment will “naturally” lead to a reduced growth in vegetation. And therefore, the Examiner has interpreted the limitations broadly to include any growth in the apple trees or fruits as long as it does not result in reduced fruit production.

Byers et al. recognizes that many trees require pruning and when trees are not pruned, this can be detrimental to pest control, fruit quality, and yield. Byers et al. also recognize that plant growth regulators need to be evaluated for their potential to reduce vegetation growth on tree fruits, thereby reducing pruning costs and improving fruit quality (see the introduction). Thus, it is known in the art that controlling the growth in apple trees is important in improving fruit quality.

Byers et al. also teach that the combination of Apogee (prohexandione-calcium) and ethephon had great control of the growth of apple trees and that flowering and fruit set were not promoted by these applications (see Expt. 2 in the method and results section). Although Byers et al. do not specifically recite the quality of the fruit, Byers et al. do not teach that flowering or fruit set were inhibited or reduced by the combined applications of Apogee (prohexandione-calcium) and ethephon. Since it is known in the art that a lack of tree pruning can be detrimental to an apple fruit tree and result in reduced quality of the fruit, one of ordinary skill in the art can reasonably assume that controlling the growth of apple tree will result in a plant of improved floral development. Especially since the combined application of Apogee (prohexandione-calcium) and ethephon did not result in reduced flowering or fruit set.

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Further, there is no difference between the method step taught in the prior art and the instant claims. The instant claims are drawn to applying compounds of formula I and ethephon to pome fruit plants or parts of pome fruits plants, simultaneously or in succession. The prior art reference is applying the same instantly claimed compounds in the same manner as instantly claimed to a pome fruit tree. The limitation of "preventing reduced floral development" and "preventing biennial bearing" will inherently occur when the compounds are applied to the apple trees. Or in other words, by practicing the prior art method, the instantly claimed method would inherently occur.

Therefore, Applicant's arguments are not convincing and the rejection is maintained.

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

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2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 12,15-18, 20, 22, 24-26, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Byers et al., (The influence of Apogee and Its combination with Ethephon, Chemical Thinners, Cations, and/ or Adjuvants, Proceedings-Plant Growth Regulations Society of America, 2000) in view of McCarthy et al. (US 4,361,436) and Motojima et al. (US 4,560,403)

### ***Application Claims***

Applicant claims a method of at least partially preventing reduced floral development of pome fruit plants resulting from applying at least one compound of formula I, said method also comprising applying 2-chloroethylphosphonic acid (ethephon) to said plant or parts thereof.

Applicant also claims a method of treatment of pome fruit plants resulting from applying at least one compound of formula I, said method also comprising applying 2-chloroethylphosphonic acid (ethephon) to said plant or parts thereof.

### **Determination of the scope and content of the prior art**

#### **(MPEP 2141.01)**

Byers et al. teach the influence of Apogee (prohexandione-calcium) and ethephon on apple tree growth, control and return bloom (see the abstract and



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Introduction). The combination of Apogee and ethephon were found to provide good control of tree growth compared to the compounds used separately (see the Material and Methods, and Results and Discussion sections).

**Expt. 2.** In 1998, forty-eight 4-year-old Fuji/M.9 trees (8 blocks) were selected for 8 treatments (Figure 2). Prohexadione-calcium was applied alone to drip in 3 applications to the same trees at 63 ppm at PF, PF+14, and PF+28 days or PF+28, PF+42, and PF+56 days. In addition, ethephon was applied alone at 135 ppm at PF, PF+14, and PF+28 days or PF+28, PF+42, and PF+56 days. A combination of ethephon applied at PF, PF+14, and PF+28 days plus Apogee applied PF+28, PF+42, and PF+56 days; or a combination of Apogee was applied at PF, PF+14, and PF+28 days plus ethephon applied PF+28, PF+42, and PF+56 days. In the dormant season, average shoot length of the longest top two shoots, length of the five longest scaffold shoots, total length of shoots longer than 30 cm, weight and basal and terminal shoot diameters of these scaffold shoots, nodes/cm of the basal 40 cm, nodes/cm of the upper 30 cm of shoots, and time required to prune each tree, number of cuts/tree, and pruning weights/cm<sup>2</sup> trunk cross-sectional area (TCSA) per tree were recorded.

**Expt. 2.** In 1998, 3 applications of Apogee (63 ppm) or ethephon (135 ppm) did not affected shoot growth of Fuji/M.9 trees at these low rates (Figure 2). Only combinations of Apogee and ethephon gave good control of tree growth. Flowering and fruit set were not promoted by any of these applications.

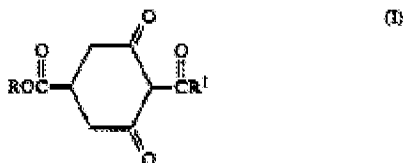
### **Ascertainment of the difference between the prior art and the claims**

#### **(MPEP 2141.02)**

Byers et al. teach regulating plant growth comprising the application of Apogee, a cyclohexane derivative (i.e. prohexandione-calcium) and 2-chlorophosphonic acid (ethephon) but do not teach the instantly claimed compound in claim 11. Byers et al. also do not teach the instant claimed ratio (i.e. 10:1 to 1:5) or the concentration of the instantly claimed compound of formula I and ethephon. This deficiency is cured by the teachings of Motojima et al. and McCarthy.

Motojima et al. teach cyclohexane derivatives of formula I.

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(see the abstract, column 1 lines 45-68, and columns 2-4). The cyclohexane compounds exhibit useful plant growth regulating effects on crop plants (see the abstract). The compounds can provide a variety of plant growth regulating effects (see column 16 lines 29-68 and column 17 lines 1-13). The rate of application for the compounds will vary between 0.01 and 50 kg per hectare and the concentration will range between 10ppm and 10,000ppm (see column 18 lines 3-39, and 53-57). The composition can be applied to the foliage, soil, seed, bushes and trees (see column 17 lines 27-35).

McCarthy et al. teach a plant growth regulating mixture comprising a 2-halo-ethylphosphonic acid, particularly 2-chloroethylphosphonic acid that can achieve enhanced plant growth regulatory effects (see the abstract and column 4 lines 33-42). The compositions are of particular interest in the treatments of apple trees as well as pears trees, cherries, etc. (see the abstract, column 9 lines 57-67, and column 10 lines 1-24). The composition can further comprise a carrier and diluent (see column 7 lines 23-25). The composition can further include an additional plant growth regulator (see column 7 lines 26-29). Various plant growth regulation effects can be achieved with the composition (see the abstract, column 3 lines 61-66 and column 10 lines 25-47). The actives in the composition can contain a concentration of between 0.0001ppm and

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100,000ppm and an application rate of between 0.1kg/ha to about 12,000kg/ha (see column 6 lines 1-8). However, the concentration and application method will vary depending on species of plant, climate, response desired, etc. (see column 5 lines 58-68). The composition can be applied by spraying, irrigation, washing dusting etc. (see column 6 lines 8-14).

### **Finding of prima facie obviousness**

#### **Rational and Motivation (MPEP 2142-2143)**

One of ordinary skill in the art would have been motivated to incorporate the instantly claimed compound of formula I taught in claim 11, because Motojima et al. teach prohexandione-calcium as well as the compound described in instant claim 11. Both of the compounds are similar in structure and described as useful plant growth regulators, as suggested by Motojima et al.

Thus, it would have been obvious to one of ordinary skill at the time of the invention to incorporate the instantly claimed compound of formula I taught in claim 11 because it is an obvious variation of functionally equivalent cyclohexane plant growth regulating compounds that are capable of use in the formulation taught by Byers et al. Thus, the additional cyclohexane compound can further enhance the growth regulating control on apple trees. Furthermore, it would be reasonable for one of ordinary skill in the art to substitute the compound in instant claim 11 for Apogee, since both cyclohexane compounds are similar in structure and have the same functionality. Thus,

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one of ordinary skill in the art can reasonably assume that both compounds will have a similar effect.

Although Byers et al. do not teach the instantly claimed ratio of the instant claimed compounds of formula I to ethephon, Motojima et al. and McCarthy et al. do suggest the amounts of each compound that is useful in regulating plant growth in apple and pear trees. McCarthy et al. suggest the actives in the composition can contain a concentration of between 0.0001ppm and 100,000ppm and an application rate of between 0.1kg/ha to about 12,000kg/ha (see column 6 lines 1-8). Motojima et al. suggest the rate of application for the compounds will vary between 0.01 and 50 kg per hectare and the concentration will range between 10ppm and 10,000ppm (see column 18 lines 3-39, and 53-57). Furthermore, both Motojima et al. and McCarthy et al. teach that the amount of compound that is used depend on various factor including the type of plant used, the type of formulation, temperature, the health of the plant, etc. it would have been obvious to one of ordinary skill in the art to sue the instant compounds in the ratio and concentration instantly claimed because, it is merely routine optimization for one of ordinary skill in the art to determine the amount of each compound is necessary to achieve a composition with the desired formulation.

Therefore, the claimed invention would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made because the prior art is fairly suggestive of the claimed invention.

***Response to Arguments***

Applicant's arguments filed July 22, 2010 have been fully considered but they are not persuasive.

Applicant argues that Byers et al, McCarthy and Motojima do not teach the instantly claimed application ratios.

This argument is not convincing. As stated above, Byers et al. already teach the combination of Apogee, a cyclohexane derivative (i.e. prohexandione-calcium) and 2-chlorophosphonic acid (ethephon) for controlling apple tree growth. Thus, the combination of Apogee and 2-chlorophosphonic acid (ethephon) is not novel. Although Byers et al. do not teach the instantly claimed ratio of the instant claimed compounds of formula I (in instant claims 15 and 22) to ethephon, both Motojima et al. and McCarthy et al. do suggest the instantly claimed amounts of each compound that is useful in regulating plant growth in apple and pear trees. Furthermore, both Motojima et al. and McCarthy et al. teach that the amount of compound that is used depend on various factor including the type of plant used, the type of formulation, temperature, the health of the plant, etc. It would have been obvious to one of ordinary skill in the art to sue the instant compounds in the ratio and concentration instantly claimed because, it is merely routine optimization for one of ordinary skill in the art to determine the amount of each compound is necessary to achieve a composition with the desired formulation.

Applicant also argues that Byers et al. do not teach that the combination of prohexadione-Ca and ethephon will promote flowering and there would not have been

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any motivation to try and reverse the negative action of acyclohexandiones on subsequent flowering by ethephon as it would not have been expected.

Applicant's argument is not persuasive. As stated above in the 102(b) rejection "Response to Arguments" section, the instant claims are not drawn to promoting flowering. The instant claims (see claim 11) are drawn to preventing reduced floral development. Byers et al. specifically teach that flowering and fruit set were not affected by the combined application of combination of prohexadione-Ca and ethephon. Thus, the combination did not result in "reduced floral development".

Further, Applicant has not distinguished the method step taught in the prior art from the method step taught in the instant claims. The instant claims are drawn to applying compounds of formula I and ethephon to pome fruit plants or parts of pome fruits plants, simultaneously or in succession. The prior art reference is applying the same instantly claimed compounds in the same manner as instantly claimed to a pome fruit tree. The limitation of "preventing reduced floral development" and "preventing biennial bearing" will inherently occur when the compounds are applied to the apple trees.

Therefore, Applicant's arguments are not convincing and the rejection is maintained.

***Conclusion***

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KRISTIE L. BROOKS whose telephone number is (571)272-9072. The examiner can normally be reached on M-F 8:30am-6:00pm Est..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Johann R. Richter can be reached on (571) 272-0646. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kristie L Brooks

Examiner, Art Unit 1616

/Johann R. Richter/

Supervisory Patent Examiner, Art Unit 1616